interface unit linked to a host computer, 2) A surface analyzer program installed in the host computer graphically depicts the worn area and calculates its volume. This volume, expressed in cubic millimeters, is regarded as the "wear volume loss" of the material tested. The higher the volume loss, the greater the material wears. After a 400k wear cycle run, a Dispersalloy (amalgam) test sample showed a wear volume of $0.024mm^3$; Alert (composite available from Jeneric/Pentron Incorporated) had a wear volume of $0.041mm^3$; Solitaire (composite from Kulzer) had $0.054mm^3$; and, Tetric Ceram (composite from Vivadent) had (at only 250k wear cycles) $0.090mm^3$. In contrast, the material according to the present invention showed a volume loss of less than $0.024mm^3$. This data clearly shows an improved wear resistance (expressed in volume loss) for the material according to the invention in relation to both conventional amalgam and conventional composite dental materials.

The physical properties of this material, as such properties were discussed above, were tested by conventional techniques. As a comparison, the same physical properties were tested for Solitaire and Alert. The results of these tests are reported as follows:

Property	Inventive Composite	Solitaire®	Alert™
Depth of Cure @ 40"	6.6 mm	3.4 mm	5.8 mm
Transverse Rupture Strength	125 MPa	75 MPa	110 MPa
Flexural Modulus	11,438 MPa	3,964 MPa	15,842 MPa
Radio-opacity	2 mm Al	2 mm Al	-
Barcol Hardness	100 (med. scale)	95 (med. scale)	95 (med. scale)
Polymerization Shrinkage	2.29%	3.50%	-
Packability Index	844 g/mm^2	779 g/mm^2	465 g/mm^2
Localized Wear Index	0.022 mm^3	0.052 mm^3	0.029 mm^3
Fracture Toughness	1.65 $MPam^{1/2}$	1.34 $MPam^{1/2}$	-

Depth of cure is determined by preparing a small amount of the material to be tested by packing it into a cylindrical mold and radiating it with light by exposing the top surface of the cylinder to light. The specimen is then removed from the mold and the bottom surface of the sample is sanded to a predetermined hardness, such as a Barcol 7.0 on a medium scale. The thickness of the specimen is then measured. Other test parameters are tested according to conventional materials handling techniques. For example, diametral tensile strength was tested according to ADA 27; other properties were tested according to ISO 4049. Fracture toughness was tested according to Ruse et al., "Novel fracture toughness test using notchless triangular primsm (NTP) specimen", Journal of Biomedical Materials research, Vol. 31 (1996), pages 457-463, John Wiley & Sons, publisher.

The procedure used for determining the packability index may vary. By way of example, the procedure employed for the above reported packability index numbers employed an Instron Model 1123 Universal Testing Machine with Series IX Data Acquisition System. The sample holder included six cylindrical cups measuring 6.5 mm (millimeters) in diameter and 4.5 mm in depth (designed to simulate a tooth cavity). They were mounted in a solid block of plexiglass. The penetrator employed was a 3.15 mm diameter, 6.25 mm long, blunt tipped carbon

steel pin vertically positioned in a proper Instron UTM fixture. The procedure employed was as follows:

A. Access Packability Test on the Instron computer and verify the following test parameters:

Full Scale Loading:	0.5kg (kilograms)
Cross Head Speed:	200mm/minute
Extension Measurement:	2.5mm downward with automatic return

B. Using a plastic spatula, fill each glass cup to its brim with the material to be tested. Gently fill the test material in the cup to prevent voids. Scrape away the excess material off the top of the cup so that the material surface is level with the cup brim. Allow the sample holder to achieve an ambient temperature of 23 C (plus or minus 1) before testing, normally for at least one hour minimum.

C. Place the filled sample holder on the Instron load cell and calibrate to achieve a 0.00 kg load reading on the "Load" digital display window.

D. Center the first filled cup under the Penetrator and slowly lower the Instron cross head until the Penetrator just contacts the material surface (without penetrating it).

E. Set the extension measurement to read 0.00 mm on the digital "Extension" display window.

F. Press the appropriate computer key(s) to cause the cross head to lower (2.50mm) and return.

G. Record the Packability Index value (as maximum grams/mm^2) by pressing the appropriate computer key(s).

H. Repeat the steps for the remaining five cups in the sample holder.

I. Press the appropriate computer key(s) to summarize and statistically analyze the test data.

The Packability Index is calculated by the following equation:

$$\text{Packability Index} = \frac{\text{Maximum Attained Force in Grams}}{\text{Area in } mm^2 \text{ of Penetrator Tip } (7.9\ mm^2)}$$

The Instron Series IX computer program automatically calculates the individual Packability Index values and prints the mean Packability Index expressing the value in grams/ mm^2 (to a precision of 1g/ mm^2). Test results have no greater than a 10% coefficient of variation (CV). Specimen cups were cleaned with methanol between use.

Other examples of the inventive composition as exemplified above showed the following physical characteristics:

Property/Characteristic	A	B	C	D
Packagbility Index - g/mm^2	872	794	844	847
Polymerization Shrinkage - 0/0	2.50	2.45	2.29	2.35
Localized Wear - mm^3	0.0145	0.0221	0.0207	0.0236
Flexural Strength - MPa	132	120	125	139
Flexural Modulus - MPa	11,344	11,509	11,438	10,786
Compression Strength - MPa	322	332	320	325
Diametral Strength - MPa	45.3	46.3	46.5	51.0
Depth of Cure - mm	6.3	6.6	6.6	506
Barcol Hardness	100	99	100	99
Radiopacity - mm Al	2 mm	2 mm	2 mm	2 mm
Water Sorption - $\mu g/mm^3$	6.3	5.1	7.4	9.3
Water Solubility - $\mu g/mm^3$	0.7	1.3	0.6	2.1

In another example of the inventive composition, a sample was prepared as above but with a filler component having 25 percent by weight of (a), 60 percent by weight of (b) and 15 percent by weight of (c). Tests were conducted as above and showed a compressive strength (MPa) of 302 (plus or minus 26); diametral tensile strength (Mpa) of 48 ($\pm$ 4); transverse strength (Mpa) of 127 ($\pm$ 12); a flexural modulus (Gpa) of 11 ($\pm$ 0.5); a wear volume loss (cubic mm at